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ROYAL BOTANIC GARDENS,
KEW.



FERNS

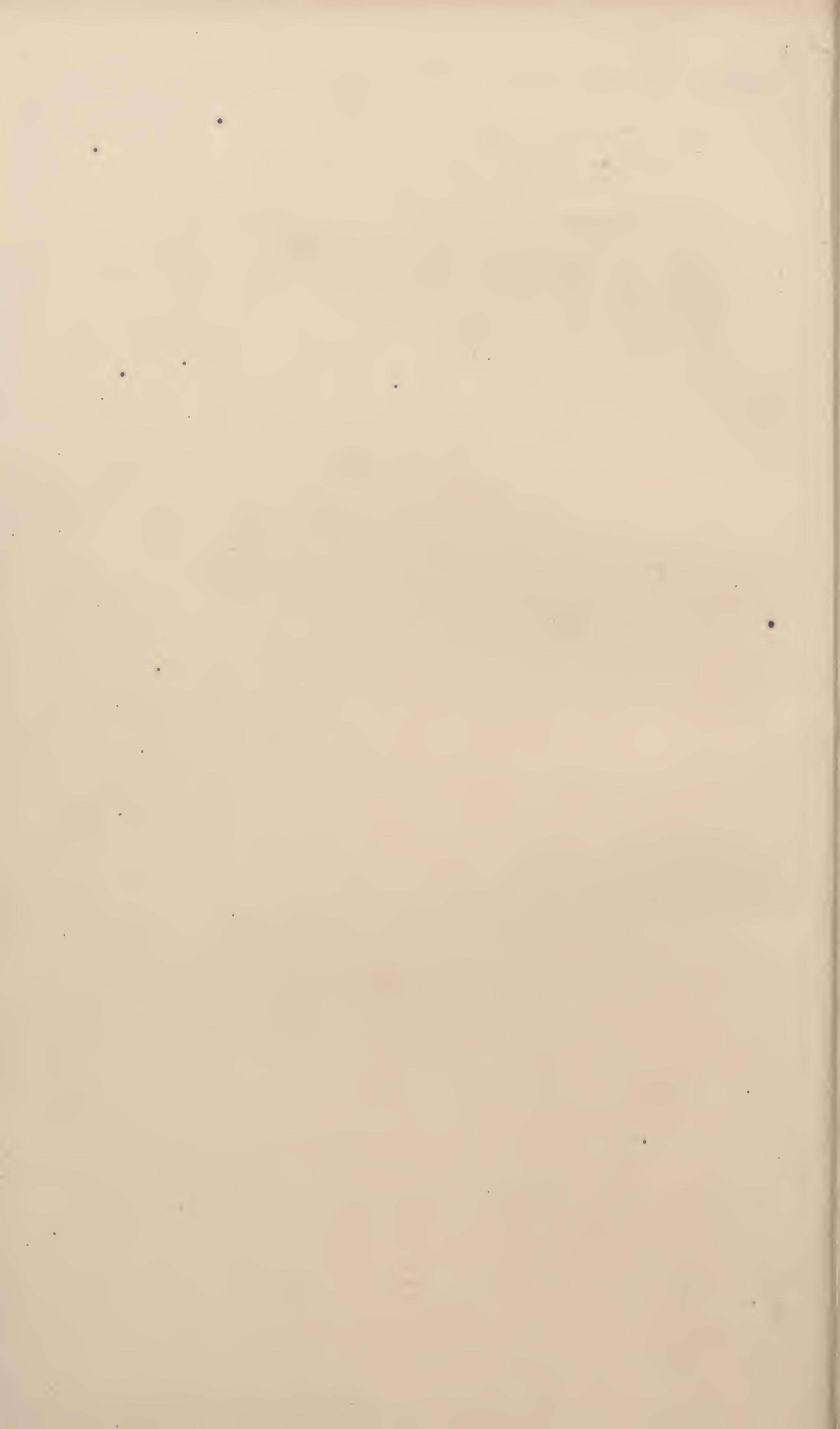
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W. C. G. 1883





Botanica
—
F E R N S

OF THE

B R I T I S H I S L E S

Described and Photographed.

BY

S. J.

[Sydenham, Croydon, 1878.]

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P R E F A C E.

NOTWITHSTANDING the number of works upon British Ferns which have been published of late years, the author believes this little volume may be found of some service.

It is not intended as a substitute for the admirable treatises of Newman, Sowerby, Moore, and others, but rather as a convenient Handbook for Amateur Collectors, which will give correctly, and without the necessity of much searching, the distinguishing features of every species, and the means of quickly identifying any specimen that may be found. With this aim, the author has limited the contents of the volume to an accurate and concise account of each Section or Group, Genus, and Species, and has purposely omitted any description of the methods of cultivation, propagation, drying and preserving, &c., as full particulars on all these points are to be found in many other books.

The Habitats are mentioned in general terms, but are not precisely and minutely described according to

the practice of some writers, who have done their best to hasten the extermination of many of the rarer kinds of ferns. Varieties of some species are occasionally met with, but only a few of the most important are described. On the other hand some ferns here given as distinct species, are considered as only varieties by other authors. The genus of any of them can be easily ascertained from the fructification.

The photographs are all from specimens collected by the author, and the woodcuts are enlarged and drawn from nature. The former will bear examination with a low-power magnifying glass, which instrument it may be added, is almost indispensable to the fern collector.

A slight sketch of the structure and reproductive organization of Ferns is also given.

A Glossary and a Table of Synonyms will be found at the end of the volume.



STRUCTURE AND REPRODUCTION.

It is not intended in the present volume to enter into any detailed description of the structure and mode of reproduction of ferns ; but a few words on the subject may not be out of place.

The name " Fern " is given by botanists to a certain division of plants which do not bear flowers, but which produce their seeds or germs either on the leaves themselves, or on a separate naked branch of the leaf devoted to that purpose.

These germs or *Spores* are very minute, angular bodies, contained in circular or oval vessels called *Thecae* or *Sporangia*, (see page 60), which are in most cases encompassed by an elastic ring or *Annulus*. The thecae usually grow in clusters, called *Sori*. When mature, the annulus dries up, contracts, and bursts open, thereby rending asunder the thecae and ejecting the spores contained within. In such of the species as have no annulus, the thecae are two-valved, and open of themselves when mature.

Each of the spores which falls on suitable ground, begins to germinate, and sends downwards hair-like roots ; and, nourished by these, gradually develops into a flat green expansion termed the *Prothallium*.

On the under surface of this prothallium, appear in course of time two sets of organs, the *Archegonia*, and the *Antheridia*. The archegonium appears at first as a

small raised portion of the surface of the prothallium, which grows more elevated as it develops, until it finally becomes a conical protuberance, at the base of which is the *Germ-cell* containing the young germ. Above this germ-cell is a second cell filled with a mucilaginous fluid, which after a time swells, and forces a passage through the apex of the archegonium, around which it collects.

The antheridium first appears as a large circular cell enclosed in a projecting portion of the surface of the prothallium. A quantity of smaller cells can soon be observed in the interior of the larger one, each of which contains a coiled up filament called an *Antherozoid*. These antherozoids are, in course of time, set at liberty by the bursting of the surrounding cells; and when unfolded, are minute, thread-like bodies, furnished at their smaller extremity with several long arms or *Cilia*.

On issuing from their cells, the antherozoids rotate and appear to be endowed with the power of independent motion, which is believed to be due to the before-mentioned cilia. As they move across the surface of the prothallium, many of them are retained by the mucilage collected round the orifice of the archegonium, and by its means, find their way along the passage to the germ. This is fertilized by contact with the antherozoids, and from it a young plant begins to grow.

Some time after fertilization the prothallium decays and dies away. It may frequently be observed attached to the young plant.

CLASSIFICATION.

WRITERS upon British Ferns are not at all agreed as to their correct classification ; nor, in the case of many species, have they adopted the same names. The usual plan, and the one which has been followed here, is to divide them into three principal Groups, which are again sub-divided into the various Genera and Species.

In the following pages are described, first the distinctive features of each Group ; then those of each Genus belonging to that Group ; and lastly those of each Species belonging to that Genus. It is chiefly by the arrangement and description of the sori, indusia, and veins, that the Group and Genus of any fern is determined.

In the case of perfect and mature fronds identification is easy even for beginners ; but it is often impossible for anyone to name young or seedling plants with accuracy. The table, page 53, will be found of assistance in distinguishing between some of the species which most resemble each other.

The three principal Groups into which British Ferns are divided, are—

- I. POLYPODIACEÆ.
- II. OSMUNDACEÆ.
- III. OPHIOGLOSSACEÆ.

Polypodiaceæ contain 16 Genera ; Osmundaceæ 1 Genus ; and Ophioglossaceæ 2 Genera. These are again sub-divided into various Species.

It must be distinctly understood that the previous numbers refer only to ferns of the British Isles, as many other genera of these three Groups exist in foreign countries. In the following descriptions the genera and species are arranged alphabetically.

GROUP I.

POLYPODIACEÆ.

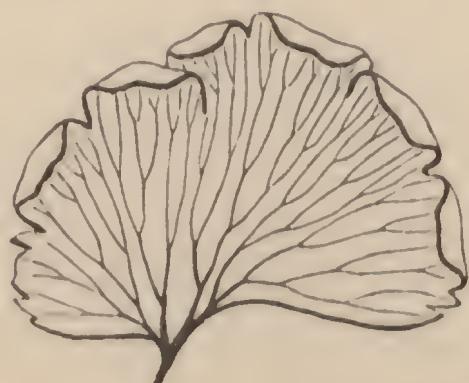
VERNATION. Circinate, the young fronds coiled up like a watch-spring. (*See page 57.*)

THECÆ. Dorsal or marginal, each enclosed by an elastic ring which bursts when mature and scatters the spores. This ring is vertical, excepting in the genera *Hymenophyllum* and *Trichomanes*.

GROUP I; GENUS I.

ADIANTUM.

SORI. In roundish masses, growing from the ends of the venules on the reflexed membranous



margin of the pinnules. This membrane is prolonged over the sori, and forms the indusium.

VENULES. Free.

PLATE I.

ONE-FOURTH NATURAL SIZE.



Adiantum Capillus-Veneris.

Osmunda Regalis.



GROUP I; GENUS I; SPECIES I.

ADIANTUM CAPILLUS-VENERIS. (*English Maiden-hair.*)

PLATE I.

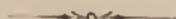
FRONDS. Tri- or bi-pinnate, deltoid in shape; nearly all fertile. Pinnæ triangular and alternate. Pinnules usually fan-shaped, but very irregular; stalked and lobed. Edges of barren lobes serrated; of fertile lobes reflexed, forming the indusium. Rhizoma small and black like fine wire. Rachis and stipes a glossy black, but reddish when young. Stipes about half the length of the entire frond, and slightly scaly at base.

GROWTH. Lax and drooping; rachis somewhat reflexed.

HEIGHT. From six to twelve inches.

COLOUR. Bright green.

HABITATS. Warm, sheltered, moist rocks. More frequent by the coast. A rare fern except on the west coast of Ireland.



GROUP I; GENUS II.

ALLOSORUS.

SORI. Growing from the upper part of the venules in oblong clusters which ultimately become

confluent. Indusium formed by the reflexed margin of the pinnule.

VENULES. Free.



GROUP I; GENUS II; SPECIES I.

ALLOSORUS CRISPUS. (*Parsley Fern.*)

PLATE II.

FRONDS. Fertile and barren fronds dissimilar; tri- or bi-pinnate, triangular in shape. Fertile fronds the taller, and contracted in appearance. Pinnæ triangular. Pinnules of fertile fronds stalked, and revolute at the edge; those of barren fronds decurrent, wedge-shaped, and serrated at the edge. Rachis green. Stipes longer than the leafy portion of the frond, and brownish at the base.

GROWTH. Fertile fronds erect. Barren fronds rather drooping. The latter resemble parsley.

HEIGHT. Fertile fronds from six to twelve inches. Barren fronds from three to six inches.

PLATE II.

ONE-THIRD NATURAL SIZE.



Gymnoagramma Leptophylla.

Allosorus Crispus.

Blechnum Boreale.

COLOUR. Pale green.

HABITATS. Stony or rocky places of considerable elevation.



GROUP I; GENUS III.

ASPLENIUM.

SORI. Oblong and linear, growing from the sides of the venules. Indusium of the same shape but narrower than the sorus when it approaches maturity. Its unattached margin, which is towards the midvein, is nearly smooth.

VENULES. Free.



GROUP I; GENUS III; SPECIES I.

ASPLENIUM ADIANTUM-NIGRUM. (*Black Spleenwort.*)

PLATE III.

FRONDS. Bi- or occasionally tri-pinnate; triangular in shape and drawn out towards the apex. Pinnæ triangular, alternate or opposite; the lowest pair always the largest. Pinnules

lobed or pinnatifid, usually alternate; margins serrated. Texture leathery. Sori situated towards the middle of the pinnules, frequently covering the entire back of the frond when mature. Stipes black and shiny, and about as long as the leafy portion of the frond.

GROWTH. Erect when young; lax and drooping when mature.

HEIGHT. Very variable; from two to eighteen inches.

COLOUR. Young fronds bright green. Mature fronds dark, dull green.

HABITATS. Hedgerows, rocks and old walls. Generally distributed.

(See also page 53.)

GROUP I; GENUS III; SPECIES II.

ASPLENIUM ALTERNIFOLIUM. (Alternate-leaved Spleenwort.)

PLATE IV.

FRONDS. Linear and narrow, pinnate. Pinnæ distant, wedge-shaped, lobed or notched at the extremities, and all pointing upwards. The pinna at the apex of the frond larger than the rest, resembling a widening of the rachis. Stipes green, and usually short.

PLATE III.

TWO-THIRDS NATURAL SIZE.



Asplenium Adiantum-Nigrum.

Asplenium Lanceolatum.

Asplenium Fontanum.

GROWTH. Erect; in tufts.

HEIGHT. About two inches.

COLOUR. Pale green.

HABITATS. Rocks or old walls. Very rare.

GROUP I; GENUS III; SPECIES III.

ASPLENIUM FONTANUM. (*Smooth Rock Spleenwort.*)

PLATE III.

FRONDS. Lanceolate and narrow, bi-pinnate. Pinnæ oblong-ovate, extending nearly to the bottom of the stipes. Pinnules nearly oval, their margin serrated and furnished with a few sharp teeth. Rachis green and slightly winged throughout. Stipes very short.

GROWTH. Spreading when mature.

HEIGHT. From two to six inches.

COLOUR. Dark green.

HABITATS. Rocks or old walls. Has very seldom been discovered in England.

GROUP I; GENUS III; SPECIES IV.

ASPLENIUM LANCEOLATUM. (*Lanceolate Spleenwort.*)

PLATE III.

FRONDS. Lanceolate, bi-pinnate or occasionally pinnate; the longest pinnæ towards the middle

of the leafy portion of the frond. Pinnæ triangular or ovate, opposite or alternate. Pinnules stalked and lobed; the margins serrated with sharp teeth. Sori situated near the margin of the pinnules. Rachis. green; stipes short and nearly black; both slightly scaly.

GROWTH. Varies; sometimes erect and sometimes drooping.

HEIGHT. From six to eighteen inches.

COLOUR. Bright green.

HABITATS. Rocks and old walls. More common on the south and west coasts.

(See also page 53.)

GROUP I; GENUS III; SPECIES V.

ASPLENIUM MARINUM. (Sea Spleenwort.)

PLATE V.

FRONDS. Linear, pinnate. Pinnæ usually rather distant, stalked, ovate, auricled at base and serrated on the margin. Rachis green and slightly winged. Stipes black at base, and about one quarter the length of the entire frond.

GROWTH. Erect when young. This fern frequently grows in a horizontal position.

PLATE IV.

THREE-FOURTHS NATURAL SIZE.



Asplenium Septentrionale.

Asplenium Alternifolium.

Asplenium Ruta Muraria.

HEIGHT. From two to twelve inches.

COLOUR. Dark, shining green ; paler beneath.

HABITATS. Rocky coasts, especially those of the south-west.

GROUP I; GENUS III; SPECIES VI.

ASPLENIUM RUTA-MURARIA. (Rue Fern.)

PLATE IV.

FRONDS. Triangular, bi-pinnate. Pinnæ somewhat triangular or diamond-shaped, and stalked. Pinnules wedge-shaped and frequently decurrent. Free edge of indusium uneven. Rachis and stipes green, the latter purple or black at base, and about as long as the remainder of the frond.

GROWTH. Erect.

HEIGHT. Varies, but averages about three inches.

COLOUR. Dull, rather glaucous green.

HABITATS. Old walls, or crevices in rocks.

GROUP I; GENUS III; SPECIES VII.

ASPLENIUM SEPTENTRIONALE. (Forked Spleenwort.)

PLATE IV.

FRONDS. Very narrow and slight, resembling coarse grass ; bifid or trifid towards the apex ; the

divisions lobed or serrated. Stipes much longer than the remainder of the frond, and purple at the base.

GROWTH. Nearly erect.

HEIGHT. Averages three inches.

COLOUR. Dull green.

HABITATS. Crevices in rocks or old walls. A very rare fern.

GROUP I; GENUS III; SPECIES VIII.

ASPLENIUM TRICHOMANES. (*Common Spleenwort.*)

PLATE V.

FRONDS. Narrow, linear, pinnate. Pinnæ oval, opposite, stalked and slightly notched. Rachis and stipes black; the latter short.

GROWTH. Spreading, or nearly prostrate.

HEIGHT. From three to ten inches.

COLOUR. Dark green.

HABITATS. Walls and rocks; less frequently banks or hedgerows. Generally distributed.

GROUP I; GENUS III; SPECIES IX.

ASPLENIUM VIRIDE. (*Green Spleenwort.*)

PLATE V.

FRONDS. Narrow, linear, pinnate. Pinnæ roundish or ovate, stalked and notched. Rachis light

PLATE V.

HALF NATURAL SIZE.



Asplenium Marinum.

Asplenium Trichomanes.

Asplenium Viride.

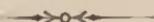
green. Stipes shorter than the leafy portion of the frond, and dark-coloured at base.

GROWTH. Nearly erect, but less stiff looking than *A. Trichomanes*.

HEIGHT. From three to six inches.

COLOUR. Bright, light green.

HABITATS. Moist, rocky places at a considerable elevation. Rather rare.



GROUP I; GENUS IV.

ATHYRIUM.

SORI. Reniform. Indusium attached to the side of the venule; its free margin fringed with hair-like segments.

VENULES. Free or anastomosing.



GROUP I; GENUS IV; SPECIES I.

ATHYRIUM FILIX-FÆMINA. (*Lady Fern.*)

PLATE VI.

FRONDS. Lanceolate, bi-pinnate. Pinnæ opposite or alternate, triangular, drawn out to a point.

Pinnules linear, serrated on the margin. Stipes about one-third as long as the rest of the frond ; its base enlarged and covered with chaffy scales.

GROWTH. The young fronds erect until fully unfolded, when they spread out forming a cup-like cluster.

HEIGHT. From one to four feet.

COLOUR. Light green.

HABITATS. Moist, warm, sheltered situations. Not uncommon.

ATHYRIUM FILIX-FŒMINA, Variety FLEXILE.

(*Flexile Lady Fern.*)

FRONDS. Bi-pinnate, narrow, lanceolate, elongated, and pinnate to the base ; flexile and brittle. Pinnæ short and obtuse. Pinnules oval, notched, and connected with each other by a slight wing. Rachis green and fleshy.

HEIGHT. From six to twelve inches.

COLOUR. Very light green.

HABITATS. This fern has only been discovered in Forfarshire, Scotland ; but probably is in reality more widely distributed.

PLATE VI.

ONE-TENTH NATURAL SIZE.



Pteris Aquilina.

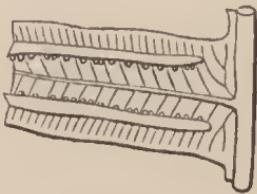
Athyrium Filix-Fœmina.

GROUP I; GENUS V.

BLECHNUM.

SORI. Form a continuous line parallel to the mid-vein, and midway between it and the margin of the pinna. Indusium continuous, opening towards the centre of the pinna.

VENULES. Free.



GROUP I; GENUS V; SPECIES I.

BLECHNUM BOREALE. (*Hard Fern.*)

PLATE II.

FRONDS. Fertile and barren fronds dissimilar; linear-lanceolate. Fertile fronds the taller of the two, and pinnate; pinnæ linear-lanceolate, and contracted in width, the lower ones being only rudimentary projections. Barren fronds deeply pinnatifid; lobes rounded and smooth on edge. Stipes short and green in the barren, and rather long and dark in the fertile fronds; scaly at base.

GROWTH. Fertile fronds very erect; barren fronds nearly prostrate.

HEIGHT. Fertile fronds from one foot to two feet.
Barren fronds about half that height.

COLOUR. Dull green.

HABITATS. Common in damp heathy situations.



GROUP I; GENUS VI.

CETERACH.

SORI. Oblong, and usually attached to that side of the venules which is furthest from the margin of the frond. Indusium in mature fronds represented by a scarcely perceptible, erect, membranous ridge just behind the sorus; but more evident in very young fronds.

VENULES. Anastomosing.



GROUP I; GENUS VI; SPECIES I.

CETERACH OFFICINARUM. (Scaly Spleenwort.)

PLATE VII.

FRONDS. Linear, deeply pinnatifid, thick and fleshy. Lobes alternate. The whole of the back of

PLATE VII.

HALF NATURAL SIZE.



Hymenophyllum Tunbridgense.

Ceterach Officinarum.

Hymenophyllum Unilaterale.

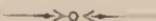
the frond densely covered with chaffy, brown, imbricated scales which nearly conceal the sori. Stipes short, brown and scaly. The young fronds have a silvery white appearance on the back.

GROWTH. Erect; rather straggling when old.

HEIGHT. From two to six inches.

COLOUR. Dull, rather dark green when mature. The young fronds lighter in colour.

HABITATS. Old walls and rocks. More common in the western maritime counties.



GROUP I; GENUS VII.

CYSTOPTERIS.

SORI. Nearly circular. Indusium like a pointed hood attached by its broad base on the side of the



sorus nearest the mid-rib of the frond. Its unattached margin is jagged.

VENULES. Free.

GROUP I; GENUS VII; SPECIES I.

CYSTOPTERIS FRAGILIS. (Brittle Bladder Fern.)

PLATE VIII.

FRONDS. Lanceolate, bi-pinnate. Pinnæ lanceolate. Pinnules ovate or triangular, deeply pinnatifid; lobes slightly serrated. Rachis green. Stipes less than half the length of the entire frond; dark and scaly at base. Fronds very brittle.

GROWTH. Erect.

HEIGHT. From three inches to one foot.

COLOUR. Light, bright green.

HABITATS. Generally distributed, but rarer in the south-eastern counties.

(See also page 53.)

CYSTOPTERIS FRAGILIS, variety ANGUSTATA.
(Narrow Bladder Fern.)

PLATE VIII.

FRONDS. Rather larger than *Cystopteris Fragilis*; apex of fronds and of pinnæ drawn out and attenuated; pinnæ farther apart. Texture thin. Not uncommon.

CYSTOPTERIS FRAGILIS, variety DENTATA.
(Toothed Bladder Fern.)

PLATE VIII.

FRONDS. Rather smaller than *Cystopteris Fragilis*.

PLATE VIII.

TWO-THIRDS NATURAL SIZE



Cystopteris Fragilis.

Cystopteris Dentata.

Cystopteris Angustata.

Pinnæ and pinnules blunter, and more obtuse; the latter notched into blunt lobes. Not uncommon.

CYSTOPTERIS FRAGILIS, variety DICKIEANA.

(*Dickie's Fern.*)

PLATE IX.

FRONDS. Shorter, more compact, and blunter than *Cystopteris Fragilis*. Pinnæ blunt, ovate, and overlapping. Pinnules broad, obtuse, and overlapping.

COLOUR. Deep green.

HABITATS. A sea cave in Aberdeenshire is the only known habitat.

GROUP I; GENUS VII; SPECIES II.

CYSTOPTERIS MONTANA. (*Mountain Bladder Fern.*)

PLATE IX.

FRONDS. Triangular, tri-pinnate below, and bi-pinnate towards the apex. Pinnæ triangular; the lowest pair very much larger than the others. Ultimate pinnules oblong, pinnatifid or deeply lobed. Rachis and stipes green, the latter longer than the rest of the frond, dark coloured and slightly scaly at base.

GROWTH. Erect; fronds springing from a creeping rhizoma.

HEIGHT. From four to nine inches.

COLOUR. Rather light green.

HABITATS. Mountainous districts in Scotland. Extremely rare.

GROUP I; GENUS VII; SPECIES III.

CYSTOPTERIS REGIA. (*Alpine Bladder Fern.*)

PLATE IX.

FRONDS. Lanceolate, bi-pinnate. Pinnæ triangular or ovate. Pinnules fan-shaped, deeply lobed; margins occasionally notched. Rachis and stipes green, the latter short.

GROWTH. Rather spreading; the fronds frequently reflexed.

HEIGHT. From two to three inches.

COLOUR. Bright green.

HABITATS. Essex, Derbyshire, and Yorkshire; extremely rare.

(See also page 53.)



PLATE IX.

THREE-FOURTHS NATURAL SIZE



Cystopteris Montana.

Cystopteris Regia.

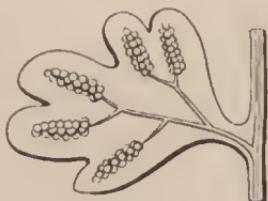
Cystopteris Dickieana.

GROUP I; GENUS VIII.

GYMNOGRAMMA.

SORI. Linear and forked, growing along the venules, and becoming confluent in maturity. Indusium wanting.

VENULES. Free.



GROUP I; GENUS VIII; SPECIES I.

GYMNOGRAMMA LEPTOPHYLLA. (*The Jersey Fern.*)

PLATE II.

FRONDS. Ovate or triangular, bi- or tri-pinnate. Pinnae triangular. Pinnules wedge-shaped, and divided into three or four deeply cut lobes which are indented on the margin. Rachis green above, and reddish brown below. Stipes nearly as long as the rest of the frond; dark and smooth.

GROWTH. Erect.

HEIGHT. From three to six inches.

COLOUR. Light green.

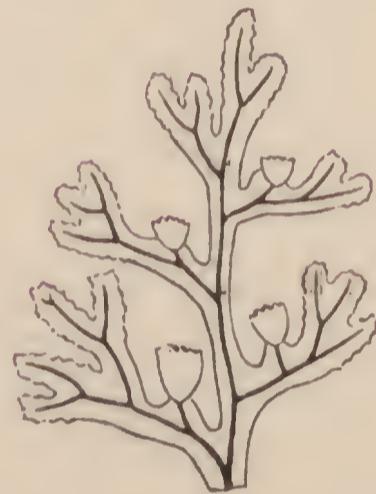
HABITATS. Shady damp situations in Jersey.

GROUP I; GENUS IX.

HYMENOPHYLLUM.

SORI. Marginal. Some of the veins project beyond the margin of the frond, and on these projections the thecæ grow, enclosed in two-valved involucres. These are situated near the junction of the pinnæ with the rachis.

VEINS. Free, and very strongly marked.



GROUP I; GENUS IX; SPECIES I.

HYMENOPHYLLUM TUNBRIDGENSE.

(*Tunbridge Film Fern.*)

PLATE VII.

FRONDS. Lanceolate, pinnate, membranous and semi-transparent. Pinnæ very deeply pinnatifid, and connected with each other by a pellucid wing extending along the rachis. Lobes oblong and furnished with spines. Involucres globular, and flattened on the upper edge where they are fringed with spines.

PLATE X.

ONE-SIXTH NATURAL SIZE.



Lastrea Filix Mas.

Lastrea Cristata.

GROWTH. Creeping; the black, wire-like rhizomas interlaced, forming matted masses.

HEIGHT. From one inch to three inches.

COLOUR. Dull, brownish-green.

HABITATS. Wet rocks or old timber. Not uncommon in mountainous districts, but rare in the southeastern counties.

(See also page 53.)

— — —
GROUP I; GENUS IX; SPECIES II.

HYMENOPHYLLUM UNILATERALE.

(*Wilson's Film Fern.*)

PLATE VII.

FRONDS. Linear, pinnate; occasionally branching so as to become bi-pinnate; membranous and semi-transparent. Pinnæ very deeply pinnatifid; convex on the upper side. Lohes oblong and edged with spines. Rachis slightly winged. Stipes black, and about one-third the length of the entire frond. Involucres pitcher-shaped, and smooth on margin.

GROWTH. Creeping; the intertwined, black, wiry rhizomas forming matted masses.

HEIGHT. From two to three inches.

COLOUR. Dull, brownish-green.

HABITATS. Wet rocks or old timber in mountainous districts. More common than *H. Tunbridgense*.

(See also page 53.)

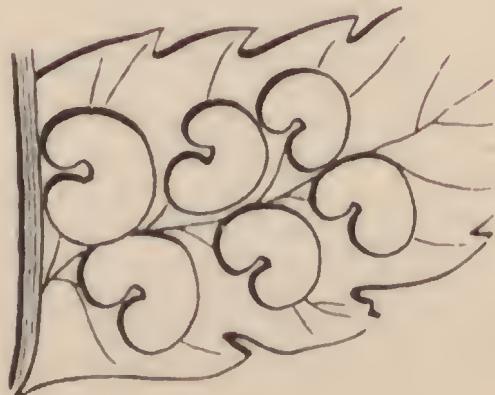


GROUP I; GENUS X.

LASTREA.

SORI. Nearly round, growing from the backs of the venules. Indusium reniform, and attached to the frond by its indented portion.

VENULES. Free.



GROUP I; GENUS X; SPECIES I.

LASTREA CRISTATA. (Crested Fern.)

PLATE X.

FRONDS. Narrow, oblong, pinnate. Pinnæ deltoid, deeply pinnatifid, rather distant, broad at base; lobes bluntly oblong. Rachis green. Stipes nearly as long as the leafy part of the frond, and thinly clothed towards its base with a few blunt, light-brown scales.

PLATE XI.

ONE-SIXTH NATURAL SIZE.



Lastrea Dratata.

Lastrea Spinulosa.

GROWTH. Very erect. Fronds rising from a thick rhizoma.

HEIGHT. Averages two feet.

COLOUR. Rather light green.

HABITATS. Boggy heaths. Most common in the counties of Norfolk, Suffolk, Cheshire, and Notts.

(See also page 53.)

LASTREA CRISTATA, variety *ULIGINOSA*.

(*Lloyd's Fern.*)

FRONDS. Narrow, linear. Fertile fronds bi-pinnate with decurrent pinnules. Barren fronds pinnate with deeply pinnatifid pinnules. Pinnæ triangular, and drawn out to a point. Pinnules oval with notched edges.

HEIGHT. From two to three feet; barren fronds shorter.

GROUP I; GENUS X; SPECIES II.

LASTREA DILATATA. (*Broad Prickly-toothed Fern.*)

PLATE XI.

FRONDS. Broadly lanceolate, bi-pinnate, and not unfrequently tri-pinnate as regards the lower pinnæ of large specimens. Pinnæ triangular, rather distant, and tapering. Pinnules oblong or triangular, deeply pinnatifid, or sometimes

pinnate as before mentioned. Lobes edged with spines. Rachis green. Stipes not quite as long as the leafy part of frond, dark coloured, thick at base, and covered with oval scales which are dark along the centre. The margin of indusium fringed with minute glandular bodies.

GROWTH. Fronds growing in a circular group drooping outwards, forming a vase-shaped cluster.

HEIGHT. Varies much. From eighteen inches to two or three feet.

COLOUR. Dark green.

HABITATS. Woods or hedgerows. Generally distributed.

(See also page 54.)

GROUP I; GENUS X; SPECIES III.

LASTREA FILIX-MAS. (Male Fern.)

PLATE X.

FRONDS. Lanceolate, bi-pinnate. Pinnæ narrow, linear. Pinnules oblong and serrated on the margins. Stipes about one quarter the length of the entire frond, and thickly clothed with scales.

GROWTH. Erect. Fronds springing in a circle from a raised crown.

PLATE XII.

ONE-FOURTH NATURAL SIZE.



Lacistema Foeniculoides.

Lacistema Rigidula.



HEIGHT. Averages about two feet.

COLOUR. Bright green.

HABITATS. Woods or hedgerows. Very common.

(See also page 53.)

LASTREA FILIX-MAS, variety *REMOTA*.

(Windermere Fern.)

FRONDS. Bi-pinnate, lanceolate and elongated. Pinnæ triangular, distant, and reflexed. Pinnules decurrent, and spiny on the margin. Sori situated close to the midrib of the pinnules. Stipes thick and scaly. The whole frond stiff and rigid.

HEIGHT. Averages about three feet.

COLOUR. Yellowish-green.

HABITATS. This fern has only been found in the neighbourhood of Windermere.

GROUP I; GENUS X; SPECIES IV.

LASTREA FÆNISECHI. (The Recurved Fern.)

PLATE XII.

FRONDS. Bi-pinnate, triangular, and reflexed. Pinnæ triangular, the lowest pair being always the longest and largest. Pinnules oblong; those

of the larger pinnæ deeply pinnatifid ; margin of lobes notched and spiny. Rachis green. Stipes about half the length of the entire frond, dark coloured, and covered with jagged scales. The whole frond has a crisped appearance, owing to the edges of all the pinnules being slightly curved upwards ; its surface is covered with minute, round glands, which are supposed to emit the peculiar hay-like odour of this fern.

GROWTH. Fronds rising in a circle from the crown, and when mature, recurved and drooping.

HEIGHT. From six inches to two feet.

COLOUR. Pale green.

HABITATS. Damp sheltered situations. Pretty generally distributed, but not very abundant. More common in the western counties, and in Ireland.

GROUP I; GENUS X; SPECIES V.

LASTREA OREOPTERIS. (*Mountain Fern.*)

PLATE XIII.

FRONDS. Lanceolate, pinnate. Pinnæ linear-lanceolate, deeply pinnatifid ; the longest pair at about two-thirds the height of the frond from the ground. Lobes oblong, and nearly smooth on margin. The under surface of

PLATE XIII.

ONE-SIXTH NATURAL SIZE.



Lastrea Thelypteris.

Lastrea Oreopteris.



the fronds covered with minute, yellow glands, emitting a peculiar odour when bruised. Rachis scaly. Stipes very short and densely scaly. The pinnæ continue nearly down to the crown, the lowest pairs being short triangular leaves.

GROWTH. Erect. Fronds springing in a circle from the crown.

HEIGHT. From one foot to three feet.

COLOUR. Yellowish-green.

HABITATS. Mountain heaths and woods. Not uncommon.

(See also page 54.)

GROUP I; GENUS X; SPECIES VI.

LASTREA RIGIDA. (Rigid Fern.)

PLATE XII.

FRONDS. Bi-pinnate, usually triangular, narrow and tapering. Pinnæ linear and tapering. Pinnules oblong and lobed; lobes notched into teeth. Stipes about one quarter the length of the entire frond, thick at its base, and very densely clothed with reddish scales. The margin of indusium fringed with minute glands.

GROWTH. Very erect.

HEIGHT. From six inches to two feet.

COLOUR. Bright green.

HABITATS. Clefts in limestone rocks in the north of England.

(See also page 54.)

GROUP I; GENUS X; SPECIES VII.

LASTREA SPINULOSA. (Narrow prickly-toothed Fern.)

PLATE XI.

FRONDS. Lanceolate, rather narrow, bi-pinnate. Pinnæ triangular, tapering, rather distant. Pinnules oblong, deeply lobed; the larger ones pinnatifid. Margins serrated and spiny. Stipes about as long as the leafy portion of the frond, and clothed with oval, pale brown scales. The surface of the frond is flat.

GROWTH. Erect. Fronds rising from crowns, several of which are connected together by a branching rhizoma.

HEIGHT. From one foot to three feet.

COLOUR. Light, yellowish-green

HABITATS. Damp woods and marshes. Generally distributed, but rarer in the northern counties.

(See also page 54.)

GROUP I; GENUS X; SPECIES VIII.

LASTREA THELYPTERIS. (*Marsh Fern.*)

PLATE XIII.

FRONDS. Lanceolate, pinnate. The fertile taller than the barren fronds. Pinnæ linear-lanceolate, pinnatifid. Lobes rounded and smooth on the margin, those of the fertile fronds being revolute at the edge, which gives them a contracted appearance. Stipes frequently longer than the leafy part of the frond.

GROWTH. Nearly erect. Fronds springing from a thin, black, creeping rhizoma.

HEIGHT. Barren fronds one foot; fertile fronds from two to two and a half feet.

COLOUR. Pale green.

HABITATS. Wet boggy heaths or marshes. Not uncommon in England.

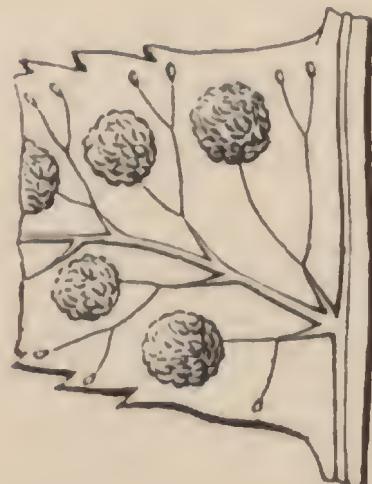
(See also page 54.)

GROUP I; GENUS XI.

POLYPODIUM.

SORI. In circular clusters growing from the extremities or backs of the venules. Indusium entirely wanting.

VENULES. Free.



GROUP I; GENUS XI; SPECIES I.

POLYPODIUM ALPESTRE. (*Alpine Polypody.*)

PLATE XIV.

FRONDS. Broadly lanceolate, bi-pinnate. Pinnæ linear-lanceolate, alternate, reaching nearly down to the crown. Pinnules oblong and lobed; lobes serrated on the margin. Rachis and stipes green, the latter clothed at its base with pointed, brown scales.

GROWTH. Fronds rising in a circle from the crown; drooping when full grown.

PLATE XIV.

ONE THIRD NATURAL SIZE.



Polypondium Alpestre

Polypondium Vulgare

HEIGHT. From six inches to three feet.

COLOUR. Light green.

HABITATS. Mountainous districts in Scotland.

GROUP I; GENUS XI; SPECIES II.

POLYPODIUM CALCAREUM. (*Limestone Polypody.*)

PLATE XV.

FRONDS. Triangular, bi-pinnate. Pinnæ triangular or lanceolate. The lowest pair, which are attached to the rachis by a bare stalk, so much larger than the rest as to give the frond a somewhat three-branched appearance. Pinnules of the lowest pinnæ pinnatifid; those of the upper pinnæ serrated. The under pinnules of the large pair of pinnæ much larger than the upper ones. The surface of the frond covered with minute glands, imparting to it a characteristic mealy appearance. Stipes green, slightly scaly, and about as long as the rest of the frond.

GROWTH. Fronds springing from a creeping, dark-coloured rhizoma; rigid, but reflexed from the junction of the lowest pinnæ with the rachis.

HEIGHT. From six to nine inches.

COLOUR. Dull green.

HABITATS. Limestone districts of England and Wales.
Local in its distribution.

(See also page 54.)

GROUP I; GENUS XI; SPECIES III.

POLYPODIUM DRYOPTERIS. (Oak Fern.)

PLATE XV.

FRONDS. This fern is conspicuously three-branched, the lowest pair of pinnæ forming the first and second, and the remainder of the leafy frond the third branch. Each branch is pinnate or bi-pinnate towards its base, and pinnatifid towards its upper part. Pinnæ linear, and convex on their upper surface. Pinnules or lobes oblong, and slightly indented on the margin. Rachis and stipes very slender, and dark-coloured; the latter very long, being frequently twice the length of the leafy portion of the frond.

GROWTH. Fronds rising from a thin black wiry rhizoma, at first resembling three little balls set on thin wires, each branch being coiled up separately. When mature, the branches are much reflexed at their junction with the common stem, and are lax and drooping.

PLATE XV.

ONE-THIRD NATURAL SIZE.



Polypodium Phegopteris.

Polypodium Dryopteris.

Polypodium Calcareum.



HEIGHT. From four to eight inches.

COLOUR. Vivid green.

HABITATS. Rocky shady situations in the north and west of England, Wales and Scotland. This fern often grows very luxuriantly close to water-falls and mountain streams.

(See also page 54.)

GROUP I; GENUS XI; SPECIES IV.

POLYPODIUM PHEGOPTERIS. (Beech Fern.)

PLATE XV.

FRONDS. Triangular and tapering; pinnate in the lower, and pinnatifid in the upper portion of the frond. Pinnæ linear-lanceolate, deeply pinnatifid, tapering to a point; the lowest pair rather distant, and always deflexed. Lobes oblong, and, in large specimens, notched on the margin. Rachis and stipes green and slightly scaly; the latter often twice as long as the rest of the frond.

GROWTH. Drooping and pendulous. Rhizoma slender and dark-coloured.

HEIGHT. From six to twelve inches.

COLOUR. Pale green.

HABITATS. Damp woods, rocky places and stone walls. Rare in the eastern and midland counties and in Ireland.

GROUP I; GENUS XI; SPECIES V.

POLYPODIUM VULGARE. (*Common Polypody.*)

PLATE XIV.

FRONDS. Lanceolate or triangular, pinnatifid nearly down to the mid-rib. Lobes linear, rounded at the apices, very slightly serrated. Sori of a bright orange colour and very conspicuous. Rachis and stipes green; the latter not quite as long as the leafy portion of the frond.

GROWTH. Erect. Fronds springing from a thick, creeping rhizoma, which is scaly when young, but bare after the first year.

HEIGHT. From six to eighteen inches.

COLOUR. Pale green when young; darker when mature.

HABITATS. Hedges, walls, rocks and trunks of trees. Common throughout the kingdom.



PLATE XVI.

ONE-EIGHTH NATURAL SIZE



Polystichum Angulare.

Polystichum Aculeatum.

GROUP I; GENUS XII.

POLYSTICHUM.

SORI. Circular, growing from the upper part of the venules. Indusium peltate or mushroom-shaped, attached to the back of the venule by a central stalk.



VENULES. Free.

GROUP I; GENUS XII; SPECIES I.

POLYSTICHUM ACULEATUM. (Prickly Shield Fern.)

PLATE XVI.

FRONDS. Lanceolate, bi-pinnate, leathery in texture. Pinnæ long, narrow, triangular and tapering to a point. Pinnules decurrent, the larger ones auricled at the base; the first upper one always larger than any other on that pinna. Margins serrated, and armed with a few sharp, stiff spines. The pinnules, excepting the first upper ones before mentioned, set on obliquely to the rachis, which is brown and covered with scales. Stipes short and densely scaly.

GROWTH. Stiff and rigid when mature; slightly prickly to the touch. Fronds rising from a large crown, the head of those not unfolded hanging down like a shepherd's crook.

HEIGHT. From two to three feet.

COLOUR. Dark green.

HABITATS. Hedgerows and woods. A very common fern.

(See also page 55.)

POLYSTICHUM ACULEATUM, variety LOBATUM.

(*Lobed Shield Fern.*)

PLATE XVII.

FRONDS. Smaller, and narrower in proportion than the preceding. Bi-pinnate as regards the first pinnules of the lower pinnæ; the rest of the frond usually pinnate, but varying much in this particular. Pinnules lobed, and distinctly auricled on the upper side.

HEIGHT. From six to eighteen inches.

A smaller variety, pinnate only, is called *Lonchitidioides*, from its having some resemblance to *Polystichum Lonchitis*.

(See also page 55.)

GROUP I; GENUS XII; SPECIES II.

POLYSTICHUM ANGULARE. (Soft Shield Fern.)

PLATE XVI.

FRONDS. Lanceolate, bi-pinnate, soft in texture. Pinnæ long and tapering. Pinnules blunt at apex, auricled at base, attached to the rachis by a distinct, slender foot-stalk, and lobed or serrated on the margin, each lobe or serrature furnished with a long spine. Rachis and stipes scaly throughout; the latter about one-third the length of the entire frond.

GROWTH. Flexible and drooping. Fronds issuing in a circular cluster from the crown.

HEIGHT. From two to four feet.

COLOUR. Dark green.

HABITATS. Hedgerows and woods. Very generally distributed.

(See also page 55.)

GROUP I; GENUS XII; SPECIES III.

POLYSTICHUM LONCHITIS. (Holly Fern.)

PLATE XVII.

FRONDS. Linear-lanceolate, pinnate, leathery in texture. Pinnules auricled on the upper side, which gives them something of a crescent

shape; margins serrated, and fringed with sharp, stiff spines. The pinnules overlap each other and continue nearly down to the crown. Stipes very short and covered with scales.

GROWTH. Very erect and rigid. Prickly to the touch.

HEIGHT. From four to twelve inches.

COLOUR. Dark, shining green.

HABITATS. The rocky, mountainous districts of Yorkshire, N. Wales, Scotland and Ireland.

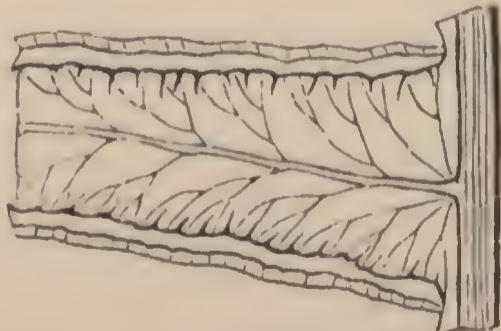
(See also page 55.)



GROUP I; GENUS XIII.

PTERIS.

SORI. Marginal, growing in a continuous line on a marginal vein, which is joined to the mid-vein by lateral branches. Indusium formed by the



prolongation of the upper skin of the revolute margin of the pinnule. A peculiarity of this

PLATE XVII.

ONE-THIRD NATURAL SIZE.



Polystichum Lonchitis.

Polystichum Lobatum.

fern is, that the under skin of the pinnule is also extended beyond the sori, which are thus enclosed between the two.

VENULES. Free in barren fronds. In fertile fronds their apices joined by a marginal vein.

GROUP I; GENUS XIII; SPECIES I.

PTERIS AQUILINA. (*Common Brake, or Bracken.*)

PLATE VI.

FRONDS. Triangular, bi- or tri-pinnate, or compound and much divided. Primary pinnæ opposite, broad in outline; secondary pinnæ narrower. Ultimate pinnules linear, tapering, and very deeply pinnatifid. The edges of lobes of fertile fronds reflexed. Rachis and stipes yellowish-green; the base of the latter dark purple, and about one-half the length of the entire frond.

GROWTH. Erect and rigid. Fronds rising from a creeping, dark, velvety rhizoma.

HEIGHT. Varies greatly; from one foot to eight or nine feet.

COLOUR. Light, faded green.

HABITATS. Woods, heaths, moors, hedgerows. The commonest of the British ferns.

GROUP I; GENUS XIV.
SCOLOPENDRIUM.

SORI. Situated about midway between the rachis and the margin; elongated and linear, growing from the outside branches of each set of parallel veins, so that the clusters are in pairs and so close together as to touch. The indusia of each pair of clusters overlap each other when young, but separate in the centre when mature.



VEINS. Free.

GROUP I; GENUS XIV; SPECIES I.

SCOLOPENDRIUM VULGARE. (*Hart's Tongue Fern.*)

PLATE XVIII.

FRONDS. Linear and entire, pointed at the apex and heart-shaped at the base. Stipes usually about one half the length of the entire frond; scaly and dark at its base.

GROWTH. Erect when young; lax and drooping when mature. Fronds growing in circular tufts.

PLATE XVIII.

ONE-FOURTH NATURAL SIZE.



Trichomanes Radicans

Scolopendrium Vulgare.

HEIGHT. From six inches to two feet.

COLOUR. Dark, shining green.

HABITATS. Damp situations. Hedgerows, old walls, ruins, and the mouths of old wells. Abundantly distributed, but less common in the northern counties.



GROUP I; GENUS XV.

TRICHOMANES.

SORI. Marginal, the thecae growing around columnar prolongations of the veins, and enclosed in cup-like involucres formed by the distention and separation of the margin of the membranous frond. These prolongations extend beyond the edge of the involucres in the form of spikes or bristles.



VEINS. Free, and very distinct.

GROUP I; GENUS XV; SPECIES I.

TRICHOMANES RADICANS. (*Bristle, or Killarney Fern.*)

PLATE XVIII.

FRONDS. Triangular or lanceolate, bi- or tri-pinnate. Texture membranous and semi-transparent. Pinnæ lanceolate, alternate. Pinnules fan-shaped, connected together by a membranous wing, and deeply cleft into notched lobes. Rachis furnished with a membranous wing extending below the leafy portion of the frond. Stipes rather long.

GROWTH. Lax and pendulous. Fronds rising from a creeping, black, scaly rhizoma.

HEIGHT. From six to twelve inches.

COLOUR. Dull green.

HABITATS. Dripping rocks in the south-west of Ireland.



PLATE XIX.

THREE-FOURTHS NATURAL SIZE.



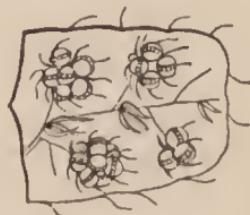
Woodsia Alpina.

Woodsia Ilvensis.

GROUP I; GENUS XVI.

WOODSIA.

SORI. Circular, situated near the margin of the pinnules. Indusium growing from beneath the sorus, and split up into hairy, jointed filaments.



VENULES. Free.

GROUP I; GENUS XVI; SPECIES I.

WOODSIA ALPINA. (*Alpine Woodsia.*)

PLATE XIX.

FRONDS. Linear, pinnate. Pinnules rather distant, bluntly triangular or roundish, and notched into distinct, rounded lobes. The fronds have a few scattered hairs and scales on the surface. Stipes short, slightly scaly, and jointed near the base, at which point the old fronds fall off.

GROWTH. Erect; in tufts.

HEIGHT. From two to three inches.

COLOUR. Dull green.

HABITATS. Mountainous and rocky situations in North Wales and Scotland. An extremely rare fern.

GROUP I; GENUS XVI; SPECIES II.

WOODSIA ILVENSIS. (*Oblong Woodsia.*)

PLATE XIX.

FRONDS. Lanceolate, pinnate. Pinnules obtuse, oblong, opposite or alternate, pinnatifid towards the base and lobed towards the apex. Lobes very slightly serrated. The under surface of the frond is woolly in appearance, being thickly covered with glossy hairs and pointed scales among which the filaments of the indusium are difficult to distinguish, and the sori themselves almost concealed. Stipes short, scaly, and jointed near the base, at which point the old fronds fall off.

GROWTH. In tufts. Erect and rigid.

HEIGHT. From two to four inches.

COLOUR. Dull green.

HABITATS. Crevices in damp rocks at a considerable elevation in North Wales, Durham and Scotland. An extremely rare fern

GROUP II.

OSMUNDACEÆ.

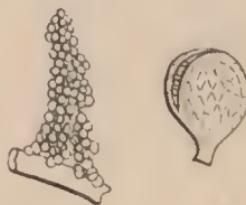
VERNATION. Circinate, the young fronds coiled up like a watch-spring. (See page 57.)

THECÆ. Situated upon a naked portion of the frond; stalked, two-valved, and not surrounded by a ring.

GROUP II; GENUS I.

OSMUNDA.

FRUCTIFICATION. Thecæ in branched masses, usually situated upon the naked upper portion of the leafy frond, where they form clusters similar to the pinnæ and pinnules of the leafy portion.



VENULES. Free.

GROUP II; GENUS I; SPECIES I.

OSMUNDA REGALIS. (Royal Fern.)

PLATE I.

FRONDS. Lanceolate, bi-pinnate. Pinnæ lanceolate and opposite. Pinnules oblong, slightly auricled at the base, and notched on the margin. Some fronds are barren and leafy to the apex; and in others the pinnules are leafy at the apex, and fertile at the base. Rachis and stipes green, smooth and fleshy; the latter about one-half the length of the entire frond.

GROWTH. Erect. Fronds springing from a thick rhizoma which in old plants rises a foot or more above the ground, appearing like a stem or trunk.

HEIGHT. From one foot to nine feet.

COLOUR. Reddish-brown when young; bright green when mature.

HABITATS. Marshy, swampy situations; borders of lakes and rivers. Generally distributed, but not very common.



GROUP III.

OPHIOGLOSSACEÆ.

VERNATION. The young fronds rolled up straight.

THECÆ. Situated upon a separate, naked branch of the frond; two-valved, and not surrounded by a ring.

GROUP III; GENUS I.

BOTRYCHIUM.

FRUCTIFICATION. Thecæ slightly stalked, and situated upon a triangular, naked, bi-pinnate branch of the frond.



VENULES. Free

GROUP III; GENUS I; SPECIES I.

BOTRYCHIUM LUNARIA. (*Moonwort.*)

PLATE XX.

FRONDS. Divided into two branches, barren and fertile. Barren branch narrow, triangular and pinnate, with from three to eight pair of crescent-shaped pinnules, which are notched on the convex side. Fertile branch bi-pinnate, the pinnules consisting of clusters of thecæ. The two branches uniting in a common stipes which is about half the length of the entire frond, the pinnules of the barren branch commencing immediately above the junction. Rachis and stipes succulent and fleshy, the latter enclosed near its base by a brown sheath. No rhizoma, but a few fibrous roots. A peculiarity of this fern is, that within the hollow stem may be seen the perfectly-formed frond of the ensuing year; and within this again, the embryo of that of the second following year.

GROWTH. Erect.

HEIGHT. Barren branch from three to four inches; fertile branch from four to six inches.

COLOUR. Glaucous green.

HABITATS. Exposed, peaty heaths and meadows. Generally distributed, but not very common.

PLATE XX.

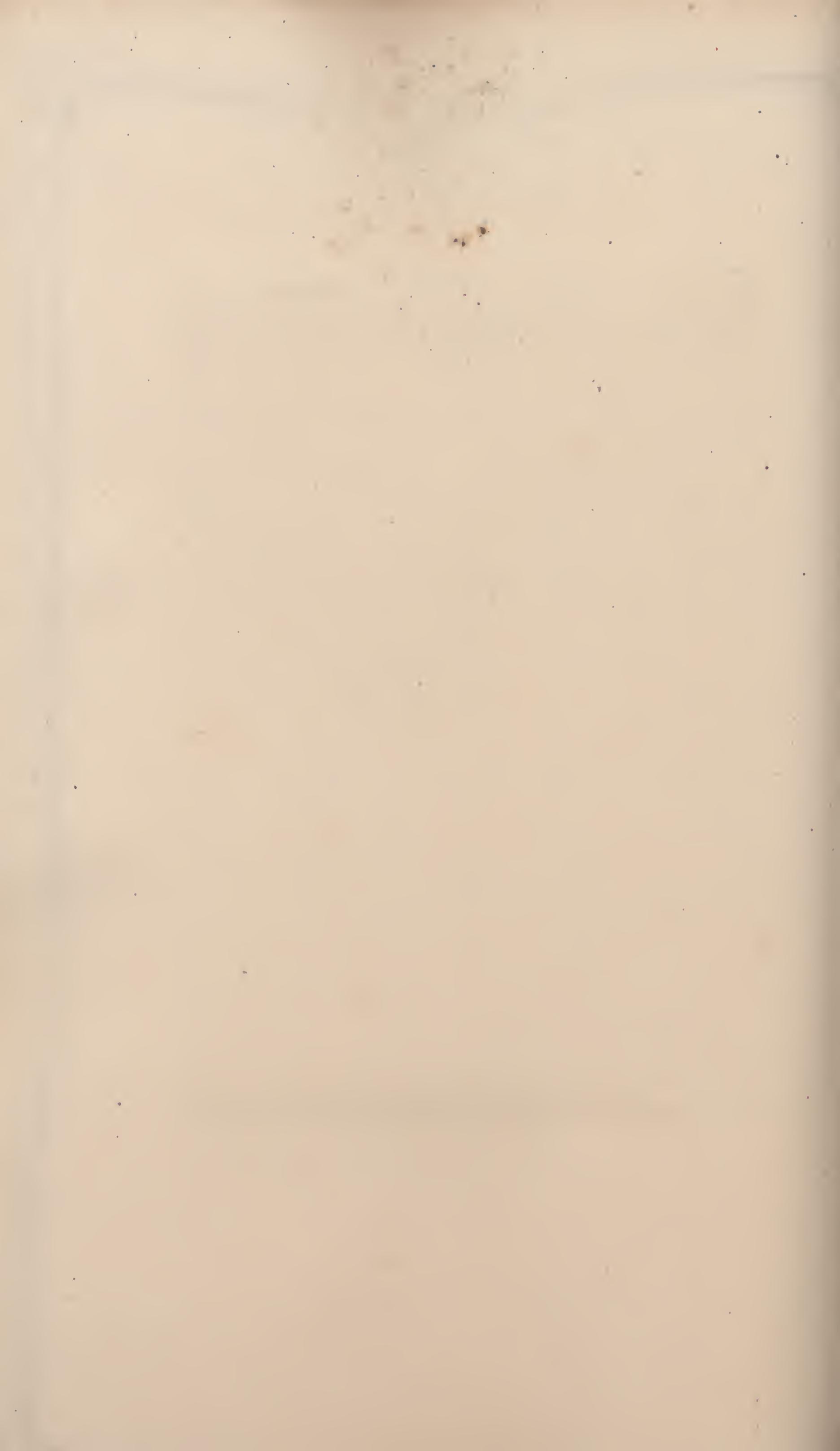
HALF NATURAL SIZE.



Botrychium Lunaria.

Ophioglossum Lusitanicum.

Ophioglossum Vulgatum.



GROUP III; GENUS II.

OPHIOGLOSSUM.

THECÆ. Situated upon the opposite sides of an erect, flattened spike; two-valved, and imbedded in the fleshy spike, to which they impart a serrated appearance.



VENULES. Anastomosing.

GROUP III; GENUS II; SPECIES I.

OPHIOGLOSSUM LUSITANICUM. (*Little Adder's Tongue.*)

PLATE XX.

FRONDS. Divided into two branches, barren and fertile. Barren branch entire, linear, narrow, and obtuse at apex. Fertile branch an erect spike, the head of which is lance- or club-shaped, and in which the thecæ are imbedded. The two branches dividing below the surface of the ground. Roots fibrous, thick and brittle.

GROWTH. Erect.

HEIGHT. About two inches; the fertile branch the taller.

COLOUR. Dull green.

HABITATS. Grassy rocks in Guernsey and Cornwall.
Rare. .

GROUP III; GENUS II; SPECIES II.

OPHIOGLOSSUM VULGATUM. (*Common Adder's Tongue.*)

PLATE XX.

FRONDS. Divided into two branches, barren and fertile. Barren branch an entire, smooth, ovate leaf. Fertile branch an erect, club-shaped spike springing from the base of the leaf; in this the thecæ are imbedded. The stipes, common to both, light coloured, succulent and hollow, and about as long as the rest of the frond. No rhizoma, but a few thick, brittle roots, which extend from the stem horizontally at some distance below the surface.

GROWTH. Erect.

HEIGHT. From three inches to one foot. When mature, the fertile branch is usually the taller.

COLOUR. Deep green.

HABITATS. Damp, clayey pastures. Generally distributed in England, but more rare in Wales, Scotland and Ireland.

The following table shows, placed in juxta-position, the especial distinctive features of some species of the same genus which are liable to be confused.

ASPLENIUM ADIANTUM-NIGRUM.

FRONDS. Triangular; the lowest pinnæ the longest.

SORI. Near the middle of the pinnules.

ASPLENIUM LANCEOLATUM.

FRONDS. Lance-shaped; the middle pinnæ the longest.

SORI. Near the margin of the pinnules.

CYSTOPTERIS FRAGILIS.

PINNÆ. Lanceolate.

STIPES. Rather long.

SORI. Confluent when mature.

CYSTOPTERIS REGIA.

PINNÆ. Triangular, ovate.

STIPES. Short.

SORI. Distinct when mature.

HYMENOPHYLLUM TUNBRIEGENSE.

FRONDS. Nearly flat.

INVOLUCRES. Spherical; flattened and spiny on the upper edge.

HYMENOPHYLLUM UNILATERALE.

FRONDS. Convex.

INVOLUCRES. Pitcher-shaped; smooth on the edge.

LASTREA FILIX-MAS.

FRONDS. Bi-pinnate.

PINNÆ. Linear.

STIPES. Short.

LASTREA CRISTATA.

FRONDS. Pinnate.

PINNÆ. Deltoid.

STIPES. Long.

LASTREA FILIX-MAS.

FRONDS. Lanceolate.
STIPES. Densely clothed with light-coloured scales.
HEIGHT. Averages two feet.

LASTREA RIGIDA.

FRONDS. Triangular.
STIPES. Very densely clothed with reddish scales.
HEIGHT. Averages one foot.

LASTREA OREOPTERIS.

PINNÆ. Continue nearly down to the base, decreasing in length.
STIPES. Very short.
SURFACE. Covered with minute, yellow glands.

LASTREA THELYPTERIS.

PINNÆ. Continue for about half the length of the entire frond.
STIPES. Very long.
SURFACE. Smooth.

LASTREA SPINULOSA.

FRONDS. Narrowly lanceolate; erect.
COLOUR. Yellowish-green.
SCALES. Oval and whole-coloured.

LASTREA DILATATA.

FRONDS. Broadly lanceolate; drooping.
COLOUR. Dark green.
SCALES. Lanceolate and dark-coloured along the centre.

POLYPODIUM DRYOPTERIS.

FRONDS. Very distinctly three-branched.
SURFACE. Quite smooth.
Young fronds rolled up like three little balls.
COLOUR. Brilliant green.

POLYPODIUM CALCAREUM.

FRONDS. Slightly three-branched.
SURFACE. Covered with minute glands. Pinnules of young fronds rolled up separately.
COLOUR. Dull green.

POLYSTICHUM ACULEATUM.

FRONDS. Stiff, and slightly
prickly.
PINNULES. Decurrent.

POLYSTICHUM ANGULARE.

FRONDS. Soft and lax.
PINNULES. Distinctly stalked.

*POLYSTICHUM LOBATUM,
variety LONCHITIDIOIDES.*

PINNULES. Separate.
TEXTURE. Thin.
FRONDS. Slightly prickly and
rigid.
COLOUR. Dark, dull green.

POLYSTICHUM LONCHITIS

PINNULES. Overlapping.
TEXTURE. Leathery.
FRONDS. Very prickly and
rigid.
COLOUR. Dark, shining green.

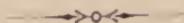


TABLE OF SYNONYMS.

It is unnecessary to enumerate all the names that have been given by different botanists to the various genera and species of British ferns. The following table includes only those most commonly used.

<i>Asplenium Alternifolium</i>	<i>Asplenium Germanicum.</i>
<i>Athyrium Filix-Fœmina</i>	{ <i>Aspidium Filix-Fœmina.</i> <i>Asplenium Filix-Fœmina.</i>
<i>Blechnum Boreale</i>	{ <i>Blechnum Spicant.</i> <i>Lomaria Spicant.</i>
<i>Ceterach Officinarum</i>	<i>Asplenium Ceterach.</i>
<i>Cystopteris Montana</i>	{ <i>Cystopteris Myrrhidifolium.</i> <i>Polypodium Montanum.</i>
<i>Cystopteris Regia</i>	<i>Cystopteris Alpina.</i>
<i>Hymenophyllum Tunbridgense</i>	<i>Trichomanes Tunbridgense.</i>
<i>Hymenophyllum Unilaterale</i> ..	<i>Hymenophyllum Wilsoni.</i>
<i>Lastrea Cristata</i>	{ <i>Aspidium Cristatum.</i> <i>Lophodium Callipteris.</i>
<i>Lastrea Dilatata</i>	{ <i>Aspidium Dilatatum.</i> <i>Lophodium Multiflorum.</i>
<i>Lastrea Fœniseccii</i>	{ <i>Aspidium Recurvum.</i> <i>Lastrea Æmula.</i>
<i>Lastrea Oreopteris</i>	<i>Lastrea Montana.</i>
<i>Lastrea Rigida</i>	<i>Aspidium Rigidum.</i>
<i>Lastrea Spinulosa</i>	<i>Lophodium Spinosum.</i>
<i>Polypodium Alpestre</i>	<i>Aspidium Alpestre.</i>
<i>Polypodium Calcareum</i>	<i>Polypodium Robertianum.</i>
<i>Trichomanes Radicans</i>	<i>Trichomanes Speciosum.</i>
<i>Woodsia Alpina</i>	<i>Woodsia Hyperborea.</i>

G L O S S A R Y.

ANASTOMOSE. To run one into the other.



APEX.

The tip.

AURICLED.

Having an ear-like projection.



BIFID.

Cleft into two.

BI-PINNATE.

Having the pinnae again divided down to their mid-rib.

CIRCINATE.

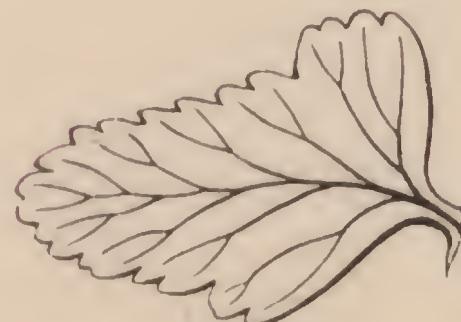
Coiled round spirally like a watch-spring.



COLUMNAR.	Like a column.
COMPOUND.	Several times pinnate.
CONFLUENT.	Uniting ; running one into the other.
CONTINUOUS.	Continuing without interruption.
CROWN.	The top of the root whence the fronds spring.
DECURRENT.	Having the base extending along the rachis.



DEFLEXED.	Bending downwards arch wise.
DELTOID.	Trowel-shaped.
DISTANT.	Separate ; having an intervening space.
DORSAL.	On the back.
ENTIRE.	Not divided nor cleft on the edge.
FILAMENT.	Thread-like fibre.
FLEXILE.	Pliant ; easily bent.
FREE.	Applied to veins not uniting.



FROND.	The entire leaf including the stipes.
GLAND.	A minute, round, bladder-like vessel.
GLAUCOUS.	Blue-green ; sea green.
HABITAT.	The natural abode or locality.
IMBRICATED.	Lying over each other like tiles on a roof.

INDUSIUM (<i>Pl. INDUSIA</i>).	The membranous skin covering the sori.
INVOLUCRE.	The indusium ; used more especially when it surrounds the sorus like a cup.
LANCEOLATE.	Lance-shaped ; broadest in the middle and tapering to the ends.
LAX.	Soft and flabby.
LINEAR.	Narrow ; of the same breadth throughout except at the extremities.
LINEAR-LANCEOLATE.	Of a very narrow lance-shape.
LOBE.	A rounded division of a leaf.
MEMBRANOUS.	Thin and semi-transparent ; like membrane.
MID-RIB.	The rachis.
MID-VEIN.	The central vein of a leaf.
OBTUSE.	Blunt at the end.
OVATE.	Egg-shaped, with the lower end the broadest.
PELTATE.	Target-shaped, with the stalk inserted underneath near the centre ; like a mushroom.
PINNÆ (<i>Sing. PINNA</i>).	The primary separate divisions of the leaf.
PINNATE.	Divided into separate, distinct leaflets.
PINNATIFID.	Cleft nearly but not quite down to the mid-rib.
PINNULES.	The ultimate or final separate leaflets of a compound frond.
PROSTRATE.	Lying flat and spreading on the ground.
RACHIS.	The main stem, from where it enters the leaf to the apex.
RECURVED.	Bent downwards.
REFLEXED.	Bent backwards.
RENIFORM.	Kidney-shaped.
REVOLUTE.	Rolled backwards.
RHIZOMA.	The creeping stem, running along, or partly under the ground.
SEGMENT.	A division of the frond.
SERRATED.	Notched.

SORI (*Sing. SORUS*). The clusters of thecæ.

SPINE. A thorn.

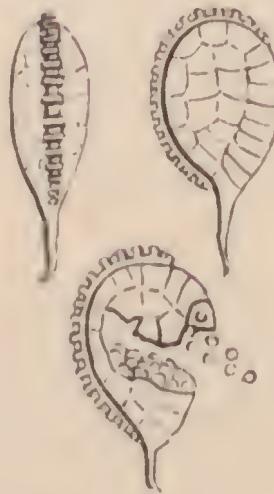
SPORANGIA (*Sing. SPORANGIUM*). The thecæ. (*Which see.*)

SPORES. The minute organs from which new plants are produced.

STIPES. The bare stem below the leafy part of the frond.

SUCCULENT. Soft and juicy.

THECÆ (*Sing. THECA*). The cases containing the spores.



TRIFID. Cleft into three.

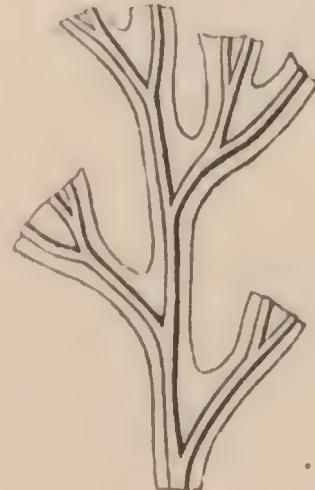
TRI-PINNATE. Three times pinnate.

VENATION. The arrangement of the veins.

VENULES. The smaller branches of the veins.

VERNATION. The manner of growth.

WING. A membranous expansion of the rachis or mid-rib.



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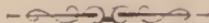
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